In the Claims:

1. (Currently Amended) A method of identifying compounds that interact with a target molecule comprising the steps of:

a) mixing a substrate, product or ligand of a target with at least one chemical compounds;

b) generating a first spectrum that displays either a chemical shift in the first dimension or a chemical shifts in the other dimension of substrate, product or ligand in step a);

c) exposing substrate, product or ligand and mixture of chemical compounds in step a) to a target molecule for one or more incubation times;

d) generating a second spectrum that displays either a chemical shifts in the first dimension or a chemical shifts in the other dimension of substrate or product in step a) that has been exposed to the target molecule in step c) in the presence of one or mixture of chemical compounds in step a);

e) comparing said first spectrum and second spectrum after one or more said incubation times in step c) to determine at least one difference between said first spectrum and second spectrum, the differences observed along either or both chemical shift dimensions identifying the transformation of said substrate and classifying the presence of one or more compounds that are substrates, products or ligands that interact with said target molecule.

2. (Original) The method of claim 1 wherein step a) further comprises a target that is a biomolecule.

3. (Original) The method of claim 1 wherein step a) further comprises a chemical compound that is in solution or attached to a solid substrate or matrix.

4. (Currently Amended) The method of claim 1 wherein step b) further comprises a first spectrum selected from the group consisting of a one-dimensional, two-dimensional ~~or~~ and three-~~dimansional~~ dimensional spectrum.

5. (Original) The method of claim 4 wherein said first spectrum displays a chemical shift in said first dimension selected from the group consisting of 1H,3H,11B,13C,15N,19F,29S or 31P chemical shift, and a chemical shift in said other dimension selected from the group consisting of 1H,3H,11B,13C,15N,19F,29S or 31P chemical shift.

6. (Original) The method of claim 1 wherein said exposing step of step c) further comprises a mixture comprising between 2 and 100 chemical compounds.

7. (Original) The method of claim 1 wherein said incubation times number between 1 and 20, 30, 40, 50 or greater.

8. (Original) The method of claim 1 wherein step d) said second spectrum displays a chemical shift in said first dimension selected from the group consisting of

1H,3H,11B,13C,15N,19F,29S or 31P chemical shift, and a chemical shift in said other dimension selected from the group consisting of 1H, 3H, 11B, 13C, 15N, 19F, 29S or 31P chemical shift.

9. (Original) The method of claim 1 wherein said comparing step of step e) comprises comparing first one- or two-dimensional NMR spectra and second one- or two-dimensional NMR spectra after one or more said incubation times.

10. (Original) The method of claim 1 wherein the determining step of step e) comprises a method selected from the group consisting of an algorithm, a computer algorithm, and visual inspection.

11. (Original) The method of claim 1 wherein an interaction is selected from the group consisting of molecule-molecule binding, ligands bound to an enzymatic site of said target molecule.

12. (Withdrawn) A method of determining an interaction constant (α) comprising the steps of: a) exposing a substrate or product to a target molecule for one or more incubation times; b) generating a first spectrum that displays either a chemical shift in the first dimension or a chemical shifts in an other dimension of the substrate or product in step a) that has been exposed to the target molecule; c) mixing a substrate with the first ligand; d) exposing the substrate and the first ligand to the target molecule for one or more incubation times; e) generating a second spectrum that displays either a chemical shift in the first dimension or a chemical shift in the other dimension of substrate or product in step c) that has been exposed to the target molecule in step d) in the presence of the first ligand in step c); f) mixing the substrate or product with one or more chemical compounds; g) exposing the substrate or product and one or more chemical compounds to a target molecule for one or more incubation times; h) generating a third spectrum that displays either a chemical shift in the first dimension or a chemical shift in the other dimension of substrate or product in step f) that has been exposed to the target molecule in step g) in the presence of the one or more chemical compounds in step f); i) mixing substrate or product with first ligand and one or more chemical compounds; j) exposing the substrate or product, the first ligand and the one or more chemical compounds to the target molecule for one or more incubation times; k) generating a fourth spectrum that displays either a chemical shift in the first dimension or a chemical shift in the other dimension of the substrate or product in step i) that has been exposed to the target molecule in step j) in the presence of the first ligand and the one or more chemical compounds in step f); l) determining a conversion rate or conversion rates of each substrate or product from each spectrum of steps b), e) ,h) and k); and deriving an interaction constant (α) from a steady-state rate equation.

13. (Withdrawn) A method using NMR for of screening for ligands which exhibit synergistic effects on a target in the presence of another ligand.

14. (Withdrawn) The method of claim 12 wherein the target is an enzyme comprising more than two binding sites.

15. (Withdrawn) The method of claim 14 wherein the two binding sites are a substrate- and co-enzyme-binding site.

16. (Withdrawn) The method of claim 12 wherein the rate is determined by the following equation:

$$v = V_m \Big/ \left[1 + \left(\frac{K_M}{S} \right) \left(1 + \frac{I_1}{K_{EI1}} + \frac{I_2}{K_{EI2}} + \frac{I_1 I_2}{\alpha K_{EI1} K_{EI2}} \right) \right]$$

wherein S, I_1 and I_2 are the substrate, inhibitor I_1 and inhibitor I_2 concentrations, respectively.

17. (Original) The method of claim 1 wherein said at least one chemical compound is provided in a multiwell vessel loaded with target and substrate, ligand, or product.

18. (Original) The method of claim 17 wherein a target-substrate reaction is quenched at a selected time.

19. (Original) A method of identifying compounds that interact with a target molecule comprising the steps of:

a) exposing substrate to a target molecule for one or more incubation times;

b) generating one or more spectra at one or more incubation times of said substrate and said target molecule of step a),

c) exposing said substrate and one or mixture of chemical compounds for one or more incubation times;

d) generating one or more spectra at one or more incubation times of said substrate, said target molecule and said compounds of step c);

e) comparing at least one spectrum of step b) with at least one spectrum of step d) to determine at least one difference between said spectrum of step b) with said spectrum of step d), the differences observed along either or both chemical shift dimensions identifying the transformation of said substrate and classifying the presence of one or more compounds that are substrates, products or ligands that interact with said target molecule.